CHAPTER 6 | PREFERRED ALTERNATIVES

As noted in Chapter 5, FWS must consider a variety of factors (43 CFR §11.82(c)) in the evaluation of the identified restoration alternatives. In general, superior projects are those that provide ecological services similar to those lost, are technically feasible with a high probability of success, are cost-effective, are unlikely to cause collateral injury to natural resources, pose little if any risk to public health, and comply with applicable laws and policies.

Considering the factors set forth at 43 CFR §11.82(c), as well as the extent of currently available funding, FWS has developed a set of restoration priorities (Exhibit 40) that reflects the restoration alternatives it prefers among those evaluated. As shown in Exhibit 40, and as discussed in Chapter 5, the restoration options vary greatly in terms of cost and in the types of effects each may have on the environment.

FWS has developed a set of restoration priorities rather than selecting specific restoration projects or locations because a final selection of specific alternatives is dependent on information that is not available at this time. This information includes public input; EPA involvement and approval; the results of restoration pilot projects and EPA's remedial activities; further evaluation of technical and administrative feasibility and costs; availability of and access to native prairie areas, degraded habitat, mine waste areas, riparian corridor habitat, and impacted streams; and individual landowner preferences. For many potential projects, either areas to be restored or preserved or easements for these areas would have to be purchased from willing landowners, and which alternative(s) to use on a given parcel of land will depend on landowner interest..

For these reasons, FWS believes that the most reasonable approach is to set forth its overall priorities (Exhibit 40) and to discuss the reasons for those priorities rather than strictly adhering to one or two approaches.

EXHIBIT 40 PRELIMINARY PREFERRED RESTORATION OPTIONS

PRIORITY	DESCRIPTION	APPROXIMATE COST (2007$)	APPROX. MAXIMUM RESTORABLE AREA[1]
TERRESTRIAL			
1	T2 – Preserve native prairie	$4,300 to $5,600 per acre plus fencing[2]	470 to 600 acres
2	T3 – High quality prairie restoration	$6,000 to $7,500 per acre plus fencing[2]	350 to 430 acres
	T4 – CRP grassland restoration	$6,700 to $8,200 per acre plus fencing[2]	320 to 390 acres
	T10 – Improve EPA mine waste caps (through soil amendments and fencing)	$2,700 per acre[4] plus fencing[2]	980 acres
	T5 – Cool season grassland restoration	$6,700 to $8,200 per acre plus fencing[2]	320 to 390 acres
3	T6 (with T3, T4, or T5) – Remove and dispose of terrestrial mine waste in subsidences; cap subsidences	$124,000 per acre[3] plus fencing[2]	20 acres
	T8 (with T3, T4, or T5) – Mine waste recontouring and encapsulation	$81,000 per acre[3] plus fencing[2]	30 acres
	T9 – Apply biosolid amendments beneath planned EPA caps	$10,100 per acre[4] plus fencing[2]	260 acres
	T7 (with T3, T4, or T5) – Mine waste recontouring	$10,300 per acre[3] plus fencing[2]	250 acres
AQUATIC			
1	A2 – Preserve high quality riparian corridors	$4,600 to $8,900 per acre plus fencing[2]	290 to 560 acres
	A3 – Preserve Empire Lake Buffer	$4,100 to $5,600 per acre plus fencing[2]	470 to 640 acres
2	A4 – Improve riparian buffer	$7,600 to $11,900 per acre plus fencing[2]	220 to 340 acres
3	A5 (with A4 and A9) – Dredge waterway(s), improve buffer, restock	$292,500 to $3.22 million per stream mile,[5] plus buffer improvement and fencing (see A4 above), $10 million for water treatment system, and $5,000 to $113,000 per species per stream mile	<1 to 5 stream miles dredged (with one mussel and one fish species restocked)[6]
	A6 – Dredge Empire Lake and install underwater sediment retention structures on Short Creek	$149,000 per acre plus $1,300,000 for dams and $350,000 for dam operation and maintenance	6 acres[6]
MISCELLANEOUS			
1	M1– Pilot projects	$30,000 to $100,000 per pilot project	
	M2 – Public outreach	$50,000 per educational film or brochure	

[1] Approximate area, assuming that all currently available funds (about $2.6 million) are expended on a single alternative. Available money is not sufficient to pursue all alternatives. Calculations are rounded.

[2] Fencing costs are not specified because they will depend on the size and shape of the area(s) being restored.

[3] The presented values include the costs of any of the potential vegetation restoration alternatives (*i.e.,* T3, T4, or T5) that could be implemented in combination with the primary alternative.

[4] Assumes KDHE will be responsible for long-term vegetation management and cap monitoring and maintenance.

[5] Assumes 11,700 cubic yards per stream mile (dredge sediments to a depth of 18 inches across a stream width of 40 feet).

[6] Excludes water treatment system costs.

As described above, some of the restoration alternatives are specific to mine waste areas while other alternatives are appropriate for non-mine waste areas. For restoration projects in non-mine waste areas, FWS prefers parcels with one or more of the following characteristics:

- Those that fall within areas designated as critical habitat for threatened or endangered species;
- Those that are larger, as larger areas generally provide superior habitat than would smaller, fragmented areas even if equal in total size;
- Those that are contiguous with or close to other protected areas, as this helps to provide wildlife corridors and decrease habitat fragmentation;
- Those that are of higher habitat quality; and
- Those with greater proximity to mining-affected areas. All else equal, areas within Cherokee County are preferred over areas in adjacent counties (Crawford, Montgomery, and Labette).

Furthermore, for projects in mine waste areas that would require coordination with EPA, issues of timing are also important—*i.e.,* those projects that allow coordination with EPA remedial actions will be preferred.

6.1 TERRESTRIAL PREFERRED ALTERNATIVES

For terrestrial habitat, FWS's preferred alternative is T2, the preservation of existing native prairie areas. Native prairies are high-quality habitats that provide the richest set of ecological services of all the alternatives. As such, native prairie preservation is well-suited to compensate for terrestrial, habitat-based ecological services lost as a consequence of mining-related contamination. Additional motivations for the selection of this alternative include the lack of technical challenges in preserving these areas, and the relatively low cost, in that the main costs are acquisition of land or easements and management of the area thereafter. Native prairie preservation will not result in collateral injury to the environment, poses no risk to the public health, and can be accomplished in a manner that is consistent with state and Federal laws and policies. In addition, habitat preservation will not delay EPA's remedial activities and will not be a detriment to the achievement of EPA's remedial goals.

For similar reasons, FWS's second overall priority is to improve habitat quality in other non-mine waste areas (Alternatives T3, T4, and T5), and to improve the habitat quality provided by EPA's mine waste caps (Alternative T10).

Of the alternatives in Group 2, FWS prefers Alternative T3; however, FWS notes that some landowners may prefer other alternatives. FWS therefore wishes to present some additional general information about its preferences with respect to restoration options. As noted above, native or high quality prairies reflect FWS's overall highest priority for terrestrial areas. If a high quality prairie planting is unacceptable, FWS considers a warm season grass planting to be the next best option. Although these mixes lack forbs, warm

season grasses leave more nutrients in the soil and provide superior habitat and forage opportunities for many native species of birds and mammals. Cool season grasses are the least ecologically desirable.

In general, the techniques for establishing a high quality prairie ecosystem, as well as the other habitat types are well-understood and have a high probability of success. Like native prairie preservation, these restoration alternatives will not result in collateral injury to the environment, pose no risk to the public health, and can be accomplished in a manner that is consistent with state and Federal laws and policies. Because of the need for additional restoration activities such as seeding, the total cost is higher than that of native prairie preservation. Both the higher cost and the lower level of ecological services provided by restored prairie relative to native prairie, make the Group 2 alternatives a lower priority than native prairie preservation.

With the exception of Alternative T10, FWS's Group 1 and Group 2 restoration alternatives are appropriate for areas that have not been significantly contaminated by mining and milling wastes. FWS's third priority group is appropriate for more contaminated areas, including contaminated lands--*i.e.*, former mine waste areas or contaminated lands around mine wastes, as well as mine waste areas themselves.

Alternative T10 and the restoration alternatives in Group 3 have the potential to reduce the bioavailability of metal contaminants; however, they are more likely to present technical challenges, and some (*i.e.*, T6 and T8) are considerably more expensive. Currently available funding from the Eagle-Picher and LTV bankruptcies is insufficient to pursue these alternatives to a large extent. Furthermore, Alternative T7 is not expected to be as effective as other Group 3 activities in reducing the bioavailability of metals in mine wastes. In addition, it is unclear as to the exact extent of mine wastes and contaminated lands that will remain following EPA's remedy–for example, EPA's plans rely on responsible chat sales before and during remedy implementation (excavation and/or consolidation followed by encapsulation, or to the maximum extent practicable, disposal in subsidences or other mine workings in the area (EPA 2006)) to reduce the volume of mine wastes. It is a combination of all these considerations that make most alternatives for restoring addressing mine wastes and contaminated lands FWS's third priority.

6.2 AQUATIC PREFERRED ALTERNATIVES

For aquatic habitats, FWS prefers Alternatives A2 and A3, the preservation of existing high quality riparian corridors and Empire Lake buffer. This preference is based on: (a) the high value of the ecological services provided by these areas and their local rarity, (b) the lack of technical challenges in preserving these areas, and (c) the relatively low cost, in that the main costs are acquisition of land or easements and management of the area thereafter. Habitat preservation will not result in collateral injury to the environment, poses no risk to the public health, and can be accomplished in a manner that is consistent with state and Federal laws and policies.

For similar reasons, FWS's second priority is to restore other riverine areas such that they provide a high quality habitat with associated buffering services (Alternative A4). In general the techniques for establishing these ecosystems, whether woody or grassy, are well-understood and have a high probability of success. Buffer restoration will not result in collateral injury to the environment, poses no risk to the public health, and can be accomplished in a manner that is consistent with state and Federal laws and policies. Because of the need for additional restoration activities such as amending soil and seeding, the total cost is higher than that of preservation. Both the higher cost and the potentially lower level of ecological services provided by restored buffer areas, relative to existing high quality areas, make this alternative to be a lower priority than buffer preservation.

FWS's first and second overall priorities do not address the issue of metals contamination in aquatic resources. FWS's third priority does address aquatic contamination;[67] however, addressing this issue in any reasonably effective fashion is expensive, and it is this consideration that makes addressing mine wastes FWS's third priority. As for terrestrial mine wastes, FWS anticipates that currently available natural resource damage funds from the bankruptcy proceedings are not likely to be sufficient to significantly address the issue of remaining mine wastes in local streams and rivers, much less in Empire Lake (following EPA remedial activities around the year 2020). However, FWS recognizes that actions directed at reducing the bioavailability of the metals in these wastes is the only way to reduce overall risks to natural resources and restore habitat for threatened species. If significant additional natural resource damage funds become available, Alternative A5 (dredging of waterways) will be considered to be equal to Alternative A4 (improving riparian buffer). FWS anticipates that dredging activities would be supplemented with both buffer improvements (to mitigate any potential adverse effects of dredging on stream banks) and with an aquatic biota stocking program, to hasten ecological recovery to the extent possible.

[67] FWS notes that the Spring River basin is Operable Unit 2 within the Cherokee County Superfund Site. Currently FWS is aware that EPA remedial activities will be likely limited to Empire Lake and portions of the Spring River downstream of Empire Lake. Thus, FWS does not anticipate that EPA would necessarily address contamination in the smaller, contaminated waterways within Cherokee County.

6.3 MISCELLANEOUS ALTERNATIVES

To complement the terrestrial and aquatic preferred alternatives proposed above, FWS wishes to implement both Alternatives M1 (pilot projects) and M2 (public outreach). FWS believes that adequate methods development and public outreach are key components to restoration project success. Although in and of themselves they do not result in significant direct improvements in project conditions, they will both, indirectly, likely improve project outcomes. Thus, two alternatives are not assigned a distinct priority relative to the other restoration projects but FWS intends to implement them regardless of the final terrestrial and aquatic–specific alternatives selected.